

Atty. Docket No. CPAC 1029-4
Appl. No. 10/681,833

PATENT

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 (original): A multi-package module, having an inverted second package stacked over a first package, the stacked packages being electronically interconnected by wire bonds, wherein at least one said package is provided with an electrical shield.

Claim 2 (original): The multi-package module of claim 1 wherein the first said package is provided with an electrical shield.

Claim 3 (original): The multi-package module of claim 1 wherein the electrical shield is configured to serve as a heat spreader.

Claim 4 (original): The multi-package module of claim 1 wherein the package that is provided with an electrical shield includes an RF die, and the shield serves to limit electromagnetic interference between the RF die and other die in the multi-package module.

Claim 5 (original): The multi-package module of claim 1 wherein the first package is a flip-chip ball grid array package having a flip chip in a die-up configuration.

Claim 6 (original): The multi-package module of claim 1 wherein the first package is a flip-chip ball grid array package having a flip chip in a die-down configuration.

Claim 7 (original): The multi-package module of claim 1 where the inverted second package is a stacked die package.

Claim 8 (original): The multi-package module of claim 7 wherein adjacent stacked die in the stacked die package are separated by a spacer.

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Claim 9 (original): The multi-package module of claim 1, the first package comprising a first package substrate and the second package comprising a second package substrate, wherein the first package substrate includes an embedded ground plane.

Claim 10 (original): The multi-package module of claim 9, the ground plane being configured to serve for heat dissipation.

Claim 11 (original): The multi-package module of claim 9, the ground plane being configured to serve as an electrical shield.

Claim 12 (original): A method for making a multi-package module including a second package stacked over a first package, comprising

- providing a first package having a shield,
- providing a second package,
- inverting the second package and stacking the inverted second package onto a generally planar upper surface of the shield, and
- electrically interconnecting the first and second packages by wire bonds.

Claim 13 (original): The method of claim 12 wherein providing the first package comprises providing an unsingulated strip of packages.

Claim 14 (original): The method of claim 12 wherein stacking the inverted second package onto the upper surface of the shield comprises applying an adhesive onto an upper surface of the shield and placing the inverted second package onto the adhesive.

Claim 15 (original): The method of claim 14 wherein the adhesive is a curable adhesive, and further comprising curing the adhesive.

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Claim 16 (original): The method of claim 12 wherein providing the first package comprises testing packages for a performance and reliability requirement and selecting the first package as meeting the requirement.

Claim 17 (original): The method of claim 12 wherein providing the second package comprises testing packages for a performance and reliability requirement and selecting the second package as meeting the requirement.

Claim 18 (original): The method of claim 12, further comprising attaching second-level interconnect balls onto the first package substrate.

Claim 19 (original): The method of claim 12, further comprising encapsulating the stacked packages in a multi-package module molding.

Claim 20 (original): The method of claim 12 wherein providing the first package comprises providing a ball grid array package.

Claim 21 (original): The method of claim 12, further comprising providing the multi-package module with a heat spreader.

Claim 22 (original): The method of claim 21, wherein providing a heat spreader comprises carrying out a drop-in mold operation, the heat spreader being placed into a mold prior to forming a module molding.

Claim 23 (original): The method of claim 21, wherein providing a heat spreader comprises affixing a generally planar portion of a heat spreader onto a generally planar upward facing surface of the second package.

Claim 24 (original): The method of claim 12 wherein providing the first package comprises providing a flip chip ball grid array package.

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Claim 25 (original): The method of claim 12 wherein providing the first package having a shield comprises providing a die-down flip chip ball grid array package.

Claim 26 (original): The method of claim 12 wherein providing the first package having a shield comprises providing a die-up flip chip ball grid array package.

Claim 27 (original): The method of claim 25 wherein providing a die-down flip chip ball grid array package having a shield comprises providing a package having a shield including a generally planar part over the die.

Claim 28 (original): The method of claim 26 wherein providing a die-up flip chip ball grid array package having a shield comprises providing a package having a shield including a generally planar part beneath the die.

Claim 29 (original): A mobile device comprising a multi-package module having an inverted second package stacked over a first package, the stacked packages being electronically interconnected by wire bonds, wherein at least one said package is provided with an electrical shield.

Claim 30 (original): A computer comprising a multi-package module having an inverted second package stacked over a first package, the stacked packages being electronically interconnected by wire bonds, wherein at least one said package is provided with an electrical shield.